THE INFLUENCE OF ORGANISATIONAL SUPPORT, TRANSACTIVE MEMORY SYSTEM AND INFORMATION TECHNOLOGY COMPETENCIES FOR FACILITATING KNOWLEDGE TRANSFER IN ENTERPRISE RESOURCE PLANNING SUCCESS

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ABSTRACT

The successes of the ERP system in an organisation depend on knowledge transfer activities made and the effectiveness of the transferred knowledge between the parties involved. It is crucial to determine a set of knowledge transfer activities that need to do besides the efforts taken by the organisation in ensuring ERP success. Currently, there is still a lack of standard knowledge transfer measurement and empirical study on the impact of organisational support towards ERP system success, especially from the context of food manufacturing. Previous research has reported various factors impacted the transfer of knowledge in strategic alliances and joint venture. Nonetheless, organisational support is the least factor mentioned, especially studies from Malaysia. For bridging the gap, two theories employed, Knowledge-Based View (KBV) theory and Organisational Learning Theory (OLT) as the fundamental theories to observe the phenomenon and further incorporate with measurement theories. The main purpose of this study is to empirically validate the KT model with three main factors that influenced the ERP success, specifically for food manufacturing in Malaysia. The study developed a Knowledge Transfer (KT) validated measurement scale based on rigorous steps to increase the reliability and validity values. A total of 56 respondents have responded to the survey from 65 companies that yield 86 per cent response rate. The respondents were selected from the executive level and above from large food manufacturing in Malaysia. Five hypotheses were accepted. The study highlighted that IT Infrastructure (0.304) is found as the most influential factors while Communication (-0.093) and Retrieval (-0.110) factors were insignificant factors that affect KT activities towards ERP success. From the results, it concluded that organisation with better infrastructure leads to increasing rates of ERP success. The proposed infrastructure is any customised system application that helps organisations stay successful in their business. However, the inability to deliver a clear message in the organisation through communication and lack of retrieval practices in Transactive Memory System (TMS) has affected the overall ERP success level whereby the current level is moderate. Therefore, based on the result, it is clear that having the correct system is very helpful in achieving ERP success in an organisation.

ABSTRAK

Kejayaan sistem ERP dalam organisasi bergantung kepada aktiviti pemindahan pengetahuan yang dibuat dan keberkesanan pengetahuan yang dipindahkan antara pihak yang terlibat. Adalah penting untuk menentukan satu set aktiviti pemindahan pengetahuan yang perlu dilakukan selain usaha yang diambil oleh organisasi untuk memastikan kejayaan ERP. Pada masa ini, masih kekurangan pengukuran pemindahan pengetahuan yang setara dan kajian empirik mengenai kesan sokongan organisasi terhadap kejayaan sistem ERP terutama dari konteks pengilangan makanan. Penyelidikan sebelumnya telah melaporkan pelbagai faktor yang mempengaruhi pemindahan pengetahuan dalam pakatan strategik dan usaha sama. Walau bagaimanapun, sokongan organisasi adalah faktor paling sedikit yang disebut terutamanya kajian dari Malaysia. Kajian ini menggunakan dua teori, iaitu teori *Knowledge Based View* (KBV) dan *Organisational Learning Theory* (OLT) sebagai teori asas untuk mengamati fenomena dan seterusnya menggabungkan teori pengukuran. Tujuan utama kajian ini adalah mengesahkan secara empiris model KT dengan tiga faktor utama yang mempengaruhi kejayaan ERP khusus untuk pembuatan makanan di Malaysia. Kajian ini membangunkan skala pengukuran yang disahkan KT berdasarkan langkah-langkah yang ketat untuk meningkatkan nilai kebolehpercayaan dan kesahan. Sejumlah 56 responden telah memberi maklum balas kepada kaji selidik daripada 111 syarikat yang menghasilkan kadar tindak balas 50%. Responden dipilih dari peringkat eksekutif ke atas dari pembuatan makanan besar di Malaysia. Lima hipotesis diterima. Kajian ini menekankan bahawa *IT Infrastructure* (0.304) dijumpai sebagai faktor yang paling berpengaruh manakala faktor *Communication* (-0.093) dan *Retrieval* (-0.110) adalah faktor yang tidak penting yang mempengaruhi aktiviti KT ke arah kejayaan ERP. Dari hasilnya, disimpulkan bahawa organisasi dengan infrastruktur yang lebih baik membawa kepada peningkatan kadar kejayaan ERP. Infrastruktur yang dicadangkan adalah aplikasi sistem yang sesuai yang membantu organisasi bertahan dalam perniagaan mereka.

Walau bagaimanapun, ketidakupayaan untuk menyampaikan mesej yang jelas dalam organisasi melalui komunikasi dan kekurangan amalan pengambilan semula di TMS telah menjejaskan tahap kejayaan ERP keseluruhan di mana paras semasa adalah sederhana. Oleh itu, berdasarkan hasilnya, adalah jelas bahawa mempunyai sistem yang betul sangat membantu dalam mencapai kejayaan ERP dalam organisasi.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABREVIATIONS

ASEAN-CCI	-	ASEAN Chambers of Commerce and Industry
AVE	-	Average Variance Extracted
BPR	-	Business Process Reengineering
CFA	-	Confirmatory Factor Analysis
CR	-	Composite Reliability
CSF	-	Critical Success Factor
ERP	-	Enterprise Resource Planning
F & B	-	Food and Beverages
FMM	-	Federation of Malaysian Manufacturers
FMM-Mafmag	-	Malaysian Food Manufacturing Group of the Federation of Malaysian Manufacturers
GoF	-	Goodness-of-Fit
HACCP	-	Hazard Analysis Critical Control Point
IMP3	-	Third Industrial Master Plan
IT	-	Information Technology
JAIN	-	*Jabatan Agama Islam Negeri*
JAKIM	-	*Jabatan Kemajuan Islam Malaysia*
KBV	-	Knowledge Based View
KKM	-	*Kementerian Kesihatan Malaysia*
KPDNKK	-	*Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Pengguna*
KS	-	Knowledge Sharing
KT	-	Knowledge Transfer
LMEs	-	Large Manufacturing Enterprises
MIDA	-	Malaysian Investment Development Authority
OLT	-	Organisational Learning Theory
OS	-	Organisational Support

PLS-SEM	-	Partial Least Square – Structural Equation Modelling
SPSS	-	Statistical Package of Social Sciences
TFP	-	Total Productivity Factor
TMS	-	Transactive Memory System
UTE	-	User Training and Education

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Introduction

In today's rapid pace of technology, the industry needs to readjust its operation strategy to adapt to global challenges and respond to its customers and competitors. The trend of using Enterprise Resource Planning (ERP) in manufacturing to attain competitive advantage is increasing because it provides an effective management system leading to significant improvements in productivity (Supramaniam & Mudiarasan, 2010). The business world is continually changing, as well as the world of technology and computer hardware and software. Newly designed apps, hardware replaced, unified integration, and innovative solutions start (Kafi, 2018).

ERP also is known as decision support systems, are used by medium to large organisational leaders to make financial decisions and operations. As many companies continue to grow on a global scale, there may be a need for ERP applications to provide visibility, collaboration, and communication throughout the organisation's supply chain due to increased competition and customer demand (Vermeulen, Niemann, & Kotzé, 2016). To minimise barriers and consequences when implementing change, organisational leaders need to develop a constructive approach (Al Haddad & Kotnour , 2015). Managers should analyse their current business environment, reflecting the organisation's strategic vision, and act on issues faced by many organisations (Goldston, 2019).

ERP helps the management to make timely decisions by providing them with the right information when needed (Ramayah, Roy, Arokiasamy, Zbib, & Ahmed, 2007). Bardhan, Whitaker & Mithas (2006) claim that advances in ERP implementation allow manufacturers to improve their production in terms of flexibility of supply chains, high-speed communication, efficiency and effectiveness in terms of improving product quality, productivity, time to market and other strategic operations. Therefore, the benefits of the ERP system are to streamline the flow of information in and throughout the business process, allowing them to work together for information processing (Dorantes *et al*., 2013).

Among all other industries, the food manufacturing industry is the most crucial because it needs to constantly meet various regulatory requirements. In terms of the economic situation, based on food industry 2018 report from Malaysian Investment Development Authority (MIDA), Malaysia is expected to be one of the leading Asian countries in the production and processing of food. The current population of 32 million with purchasing power (per capita income exceeding RM39,656 or the US $ 8,906 in 2017. Lifestyle changes have led to an increase in food demand and health food. The food exports recorded positive growth which showed increased product acceptance Malaysian food in the overseas market, mainly contributed by products such as cocoa and cocoa preparation, prepared cereals and flour preparation, processed seafood and dairy products Association of Southeast Asian Nations (ASEAN), with a population of more than 640 million has a huge potential market for tapping and Malaysia is expected to be the main food exporter for the region.

Food manufacturers also suffer temporary and consequent negative financial impacts of product returns and discharges, business interruptions and damages to their brands (King *et. al*., 2017). In a 40th annual survey conducted by the Food Engineering magazine, the number one issue faced by food companies today is food safety. The World Health Organisation (WHO) estimates that every year 600 million people in the world fall ill after eating contaminated food. That is why food safety is important for importing and exporting countries, some countries have low food safety standards and have yet to establish sufficient monitoring or reporting mechanisms for effective food safety and good ERP system is the best solution.

Nonetheless, food manufacturers hampered with many challenges such as increasing costs, government regulations, safety concerns, low margins, and constant change in consumer tastes. ERP implementation projects exposed to risk because of the project complexity and conflict of interest of various parties, time and cost constraints (Durkovic & Rakovic, 2009). Ramayah *et al*. (2007) revealed that 58% of the manufacturing organisations in Malaysia implemented ERP within the last three years and showed that 40.5% of them had losses up to 1 million due to delays or unsuccessful ERP implementation. Vendors should not only ensure the smooth running of the ERP project schedule, but also need to adjust the system to suit the business requirements of the company which requires excellent knowledge transfer between the vendor and the client (Hung, Ho, Jou, & Kung, 2012). Since manufacturing organisations often are more complex than organisations in other industries, ERP systems in the manufacturing industry can require more customisation. Hence, 60% of manufacturing ERP implementations exceed expected project completion duration (Panorama Consulting Solutions, 2015). The average ERP project implementation duration is 16.9 months (Panorama Consulting Solutions, 2017).

In the report by Panorama Consulting 2015, mentioned that 50% of respondents in the manufacturing industry had not recouped the costs of their implementation while 31% recovered their fees in two to four years. Nonetheless, few companies have succeeded. For example, Nestle is one of the companies who had success during their ERP project. Based on Dieringer (2004), their keys to success include customised packaging and focus on unidirectional communication among all departments. They believed the software itself is not able to solve organisational problems.

Additionally, not every process in the company can be re-engineered to fit the software. Hence, the current study aims to examine the most critical factors that influence effective knowledge transfer to achieve ERP implementation success in food manufacturing companies. Although previous studies attempt to exhibit different impacts of KT in outsourced ERP success, limited studies have focused on food industries.

1.2 Research background

Over the last decade, the ERP system has become an essential software which attempts to integrate all departments and functions across a company into a single computer system which helps organisations to control their operations (Devadoss & Shan, 2007). A well-planned ERP may be beneficial for improving productivity and production quality (Ali & Miller, 2017). ERP function on delineating manufacturing effectiveness besides improving intra and inter-firm coordination and linkages with the suppliers ERP systems are currently in high demand among Malaysia industries, especially those with substantial regulatory compliance requirements. Industries that use the ERP system to facilitate their businesses include aerospace and defence, construction and engineering, home improvement and furnishings, pharmaceutical manufacturing, food and beverage manufacturing, metalworking, printed products, plastics and petrochemical, electronics and technology, milling and grinding and automotive manufacturing. Each of these industries requires specialised research and expertise in developing their ERP systems.

As mentioned by Soliman and Karia (2015), the ERP system can include software for manufacturing, order entry, general ledger, accounts receivable and payable, purchase, warehousing, transportation and human. Examples of software modules in ERP, which were formerly standalone applications, include Manufacturing, Supply Chain, Finance, Customer Relationship Management (CRM), Human Resources, Warehouse Management and Decision Support Systems. ERP provides an overview of the source of an all-in-one firm. This software package can be personalised to the specific needs of each organisation (Johnson & Lorents, 2004). Managing resources efficiently and organisational activity integration is some of the critical features of ERP software (Chaudari & Ghone, 2015). Fosser *et. al.* (2008) in the study of ERP systems and competitive advantages, found that managers can initiate processes based on the ERP system output that can generate competitive advantages. However, the ERP system for the food industry needs to be developed to meet some of the set rules. The food industry is the primary example of an industry under constant pressure to meet regulatory requirements.

A proper and well-designed ERP software is a must because the food industry needs to keep up with health codes. One excellent example is the cold chain storage. New types of equipment and software make sure that food and beverage products kept at specific temperatures throughout their entire life cycle, from the raw materials supply, all of the ways through production and distribution. This can be established with different tags and markers, in conjunction with the right kinds of ERP software specialised to this sector. Other than that, the food industry is also vulnerable to environmental changes that lead to a variety of factors such as rising production costs, technological developments, shifting demand patterns and changes in the competitive grouping (Kartinah & Rabaah, 2013). The vast majority of ERP systems on the market today were initially designed for general use across a broad array of industries. Though some ERP systems incorporate specific capabilities for manufacturers, most of these planned for discrete manufacturing.

Over the years, process manufacturing "extensions" have been added to these systems in an attempt to address the unique needs of food processors. Although these extensions may appear to be appropriate for food processors, when they put into practice, many companies discover that they do not work effectively and create significant risks. This happened to Hershey's confectionery manufacturing and distribution (Perepu & Gupta, 2008). Additionally, the food industry is vital to the Malaysian economy wherein 2011, food processed from Malaysia is exported to more than 200 countries, resulting in annual export value of more than RM13billion (Malaysian Investment Development Authority, 2012). Food manufacturing and processing are expected to experience a 10% growth in sales per year in Malaysia as mentioned by The Malaysian Food Manufacturing Group of the Federation of Malaysian Manufacturers (FMM-Mafmag) representative Datuk L. Krisnan in The Sun Daily dated 8 March 2018. He also mentioned that 2017 was a challenging year for the F&B sector in Malaysia, especially with challenges such as the rising commodity prices, currency fluctuations, weaker consumer sentiment, regulatory environments and intense price competition which make decision making more complicated. Despite higher raw material prices, they focused on internal efficiency, diligent cost management and innovation for long term growth.

The F&B manufacturing sector, which includes Nestle and Fraser & Neave, recorded sales of RM43.87 billion in 2017 compared to RM39.60 billion in 2016, or a positive growth of 10.77%. During the Third Industrial Master Plan (IMP3) from 2006 until 2020, government spend RM1.6 billion per annum to get higher initiatives on total productivity factor (TFP) growth for the food processing industry. These include upgrading human resource and technology, enhancing R&D, undertaking the production and export of high value-added and niche products, and adopting a quality standard.

Food manufacturers deal with susceptible supply chains and even a small disruption within them can have devastating consequences. Hence, an ERP system will give food manufacturers more significant insight into the entire operation and assists in automated processes. Thus, it is relevant to understand the issues and challenges of ERP implementation from the perspectives of knowledge and organisational learning because ERP systems are standard information repositories that aimed at matching knowledge and skills that increase the ability of an organisation to adopt the best practices (Chadhar & Daneshgar, 2018). Nevertheless, ERP implementation in food industries face various issues and challenges such as food safety. The development of rapid distribution systems has increased the risks of contaminated food entering the food supply chain. Therefore, it is crucial to have a well-designed ERP system in food manufacturing. In addition, ERP implementation is not just a process of using software, but also a managerial tool cooperating with business process reengineering, organisational change, and other complex management activities (Chaudari & Ghone, 2015).

In Malaysia, Food Hygiene Regulation 2009 requires every proprietor and occupier of food manufacturing premises to prepare and hold a *Program Jaminan Keselamatan Makanan* (PJKM). PJKM is a well-documented practice system that guarantees that certain types of food will not harm consumers when consumed. Among the PJKMs introduces to premises involved in food manufacturing are Hazard Analysis and Critical Control Point (HACCP) and *Makanan Selamat Tanggungjawab Industri* (MeSTI). HACCP is a management system where food security is ensured through biological, chemical and physical hazards analysis and control starting from the production of raw materials, procurement and handling to the distribution and use of finished products.

These are just some of the critical aspects that organisations operating in these industries have to consider when selecting an ERP system. However, the existing PJKM is challenging to obtain by food manufacturing premises, especially Small and Medium Enterprises (SMEs). In this regard, the Ministry of Health Malaysia (MoH) has introduced a scheme that is easy to obtain and meet the minimum requirements provided in PPKM 2009, namely the MeSTI. MeSTI Certification Scheme is a rebranded scheme to replace the 1Malaysia Food Security Scheme (SK1M). Through MeSTI certification, food manufacturing premises guided in developing and implementing PJKM before recognition granted.

1.3 Problem statement

As mentioned earlier, ERP is a managerial tool to manage complex management activities in the company (Chaudari & Ghone, 2015). ERP controlled the business operation well. However, the main issues that arise in food manufacturing must first understand. Product recall is the most critical issue in the food manufacturing industry (Kartinah & Rabaah, 2013).

1.3.1 Food Manufacturing

Product recall management is the final step of the traceability system in a company. When the incidence of product recall happens, a company must have a good recall management system that works as the last defence to the company's image (Shafii, Shahwan, Muhamed, Hashim, & Mohd, 2013).

From the year 2010 until March 2012, *Jabatan Kemajuan Islam Malaysia* (JAKIM) already recalled 39 products and revoked the halal status of 10 hotels and premises and one slaughterhouse (Shafii *et al*., 2013). Once a brand has summoned a recall, it may take several years to fix the damage, not to mention the costs involved and the damage caused to the company's reputation. The implicated manufacturer can also suffer from temporary and sustained negative financial impacts due to product recall and disposal, business interruption and damage to their brand (King *et. al*., 2017). Some of the food manufacturing industries may go bankrupt as they are unable to bear the costs.

Food manufacturing also deals with the highest food traceability and federal compliance in the operation process. The International Standards Organization (ISO) defines food traceability systems as the "totality of data and operations that is capable of maintaining desired information about a product and its components through all or part of its production and utilisation chain" (ISO 22005:2007). Food traceability systems are vital as they impact firm efficiency and effectiveness performance (Alfaro & Rábade, 2009). Based on a study on "big data" method by Huang & Handfield (2014), the study provides an extensive analysis of how the deployment of ERP systems can benefit a company's supply chain performance. Big data is data that exceeds the processing capacity of conventional database systems. Traceability in food-supply chains is an emerging issue due to increased awareness of consumers about food safety and the nature of food-supply chains that have become globalised. By implementing traceability, there is a need to understand the variables and their inter-relationships that impact traceability in a food-supply chain (Faisal & Talib, 2016).

As food trade expands throughout the world, food safety has become a shared concern among both developed and developing countries (King *et. al*., 2017). Worldwide implementation and certification of Food Safety Management Systems (FSMS) have increased significantly during the last decade, reflecting the importance of assuming these standards in different activity sectors (Gil, Ruiz, Escriva, Font, & Manyes, 2017). Food safety is the concept that food will not be injurious to the consumer at the point of consumption, when it prepared and eaten according to its intended use (BS EN ISO 22000, 2005).

Mensah & Julien (2011) mentioned that developing, implementing and continually improving food safety management systems require the effort of all employees in an enterprise to be effective and efficient. The various stages of the process require particularly relevant competencies. Enterprises have three options to adopt when developing and implementing a FSMS. These include strengthening the system in-house, inviting a consultant to develop the system while providing him with the necessary resources, or jointly developing the system while making use of both in-house personnel and a consultant. ERP is one of the systems that fulfil the stated features.

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